

COURSE DESCRIPTION CARD – SPECIMEN

Faculty of Electrical Engineering									
Field of study	Automatic Control and Robotics							Degree level and programme type	Bachelor's degree
Specialization/ diploma path	-							Study profile	-
Course name	Industrial Networks							Course code	IS-FEE-10064S
								Course type	elective
Forms and number of hours of tuition	L	C	LC	P	SW	FW	S	Semester	summer
	30			30				No. of ECTS credits	5
Entry requirements	-								
Course objectives	This course deals with study of engineering principles and methodologies used to design, configure and programming of the industrial network: PROFIBUS DP. Emphasis is placed on hardware and software engineering due to PLC controller's networks based on the SIMATIC. This course fulfils the general maintenance of industry process-data exchanging between PLCs in the real-time control systems. A practice knowledge to network configuration and run-operations for peripheral devices and network diagnostics is also introduced.								
Course content	Basic of industrial network PROFIBUS DP. Physical layer, cabling, parameters. Types of data transmission, communication's protocols and bus data access methods. Fundamentals principles of PROFIBUS DP communication. Isochronous real-time (IRT) mode, layers and addressing of active and passive components. Programming of synchronous and asynchronous data exchange in PROFIBUS DP based on the SIMATIC. Diagnostic of PROFIBUS DP: diagnostic functions, errors detects and faults localization, monitoring, alarms and software blocks of PLC to data errors recording.								
Teaching methods	power-point presentations, PLC programming software, PLC simulators, text books and other technical data								
Assessment method	lecture – written exam, project – project completion, presentation and discussion, performance of the project								
Symbol of learning outcome	Learning outcomes							Reference to the learning outcomes for the field of study	
LO1	basic knowledge of principle of PROFIBUS DP network and communication protocols								
LO2	ability to programming of data exchange in the real-time industrial control systems and knowledge of distributed peripheral control devices								
LO3	basic knowledge of performing diagnostic software methods and topology design of PROFIBUS DP network and hardware components								
LO4	practical skills to design, configure, parameters set-up, start-run and service of the industrial network: PROFIBUS DP								

L05	practical skills to programming of communication functions for PROFIBUS DP	
L06	practical skills to programming diagnostic software methods, demand for cooperation with other student within group, as well as an increased awareness of its vital importance for development	
Symbol of learning outcome	Methods of assessing the learning outcomes	Type of tuition during which the outcome is assessed
L01	written exam, project evaluation, activity on project classes	L, P
L02	written exam, project evaluation, activity on project classes	L, P
L03	written exam, project evaluation, activity on project classes	L, P
L04	project evaluation, activity on project classes	P
L05	project evaluation, activity on project classes	P
L06	project evaluation, activity on project classes	P
Student workload (in hours)		No. of hours
Calculation	lecture attendance	30
	participation in classes, laboratory classes, etc.	30
	preparation for classes, laboratory classes, projects, seminars, etc.	27
	working on projects, reports, etc.	12
	participation in student-teacher sessions related to the classes/seminar/project	4
	implementation of project tasks, preparation for and participation in exams/tests	32
	TOTAL:	135
Quantitative indicators		HOURS No. of ECTS credits
Student workload – activities that require direct teacher participation		64 2.5
Student workload – practical activities		80 3
Basic references	1. Manfred Popp The New Rapid Way to PROFIBUS DP, PROFIBUS Nutzerorganisation e.V., 2004. 2. Mahalik N. P., Fieldbus Technology: Industrial Networks Standards for Real-Time Distributed Control, Springer, 2003. 3. EN 50170-2 PROFIBUS, EN 50254-3 PROFIBUS-DP, ICS 61158 i 61784 PROFINET.	
Supplementary references	1. Hugh J., Automating Manufacturing Systems with PLCs, E-book, Ver. 5.0, 2007. 2. S. Mackay, E. Wright, D. Reynders, J. Park, Practical Industrial Data Networks: Design, Installation and Troubleshooting (IDC Technology), Elsevier Linacre House, 1st edition, 2004. 3. Industrial Communication Catalog IK PI, SIEMENS, 2002/2003. 4. www.profibus.com.	
Organisational unit conducting the course	Department of Automatic Control and Electronics	Date of issuing the programme
Author of the programme	Assoc Prof. Arkadiusz Mystkowski, PhD, DSc, Eng	25.03.2020